WATER CONSERVATION NEWS

"Building sustainability, reliability, and accountability through efficient water use"

In this issue...

AB 325 Ten Years Later

By Julie Saare-Edmonds

In September 1990, Assembly Bill 325 was signed by Governor Wilson. This law enacted the Water Conservation in Landscaping Act (Govt. Code Section 65591 *et seq*.) which required the Department of Water Resources to adopt a Model Local Water Efficient Landscape Ordinance. An advisory task force was then created consisting of DWR staff, members from the League of California Cities, County Supervisors Association of California and the Green Industry Council of California. The Task Force also included members representing water agencies, commercial and residential builders, the nursery industry, nonprofit environmental protection organizations, turfgrass growers, landscape contractors and landscape architects, and manufacturers of irrigation equipment. By January 1993, local agencies were to either adopt a local water efficient landscape ordinance, adopt the state model water efficient landscape ordinance or make a statement that due to water availability and other factors an ordinance was not necessary.

The Act states that "landscapes are essential to the quality of life in California" and serve several purposes as well as recreation, and that "landscape design, installation and maintenance can and should be water efficient." Cities and counties are to enforce the ordinance as it applies to new and rehabilitated public and private landscapes that require a permit and on developer-installed residential landscapes. The ordinance does not apply to landscapes under 2,500 square feet, homeowner-installed residential landscapes, cemeteries, registered historical sites and ecological restoration and mined reclamation areas without permanent irrigation systems. During the permit process for new construction, the local agency (a city or county planning agency) reviews the plans and checks the Landscape Documentation Package for compliance to the existing ordinance. Among the Documentation Package are a series of calculations stating the Maximum Applied Water Allowance, Estimated Applied Water Use and Estimated Total Water Use. Simplified, these values represent total water budget, the amount of water in the irrigation schedule, and the total amount of irrigation water plus any effective precipitation, respectively. The Documentation Package also includes various plans and schedules for different tasks. If the measures required by the ordinance were uniformly applied, most large landscaped sites would be water efficient. But, unfortunately, the model ordinance (or local versions) is not being implemented to its full potential.

Continued.
See "AB 325" on page 2.

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AB 325

(continued from page 1)

It has been 10 years since the model ordinance went into effect and some of the results have been disappointing. According to a report published in March 2001 titled "Water Efficient Landscape Ordinance: A Statewide Review," the Act has not been as effective as hoped. This study, conducted by Dr. Anil Bamezai, Robert Perry and Carrie Pryor, surveyed 140 cities (2 cities did not respond) and 11 counties. The results of the survey indicated an inconsistency in standards, implementation and post-construction follow-up. The study team also conducted in-depth personal interviews with stakeholders regarding their personal experiences and views into implementing the Act. Those interviewed felt that there were some positives to implementing the Act such as improved landscape designs using more drought tolerant plants, better quality and more efficient irrigation systems and the increased ease of water budgeting and irrigation design using computer software.

However, many also felt there were drawbacks to the Ordinance such as there rarely being any follow-up from local agencies after construction is completed. Some agencies don't perform any post inspections, others cite that irrigation schedules are ignored and that maintenance contractors overwater regardless of the schedule or how efficient the design is. These facts are not surprising when considering that most maintenance and installation contractors interviewed were unaware of the ordinance and its requirements. Developers, as well as the general public, are also unaware of the Ordinance. Recommendations cited in the review included that planning agencies identify a position for follow up inspections and audits. Other recommendations include improvement in the ordinances themselves in structure and coverage. Education of contractors, developers and water agency staff is critical to better implementation of the Act.

The Model Water Efficient Landscape Ordinance is available on the Departments Web site at: wwwdpla.water.ca.gov/cgi-bin/urban/conservation/landscape/ordinance/index. For more information contact Julie Saare-Edmonds at (916) 651-9676 or landscape@water.ca.gov

Mission Statement of the Office of Water Use Efficiency

"To advance the efficient management and use of California's water resources in cooperation with other government agencies and the private sector through technical and financial assistance."

Outdoor Water Scheduling Made Easy

By John Wynn

Household controllers offer the most convenient way of maintaining a lush green landscape around our homes. We set the controller to maintain our landscape during the summer, and the turf and other plants survive the summer, then we tend to forget about it. If the lawn starts to dry out we simply add a few minutes of watering time. Once a comfortable program is established, we once again want to forget about it. The program times set during the summer then remain unchanged and the controller continues applying water at this high summer rate all year.

This convenience comes at a price and each year that price is going up. The controller going untouched during the year over-waters in the spring and fall when watering requirements are only a fraction of the peak summer needs. During the rainy season plants can survive with little to no supplemental watering. But still, controllers continue to apply water at summer's high rate as a matter of convenience and without regard to landscape's needs.

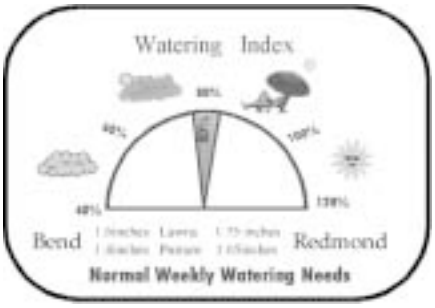
The new generation of controllers contain features that can modify applications by percentages. Since the early to mid 1980s, controllers have been built with an adjustment feature called Water Budget or Seasonal Adjust that will internally adjust watering times by the percentage input. Since the application times are adjusted by the percentage, it is no longer necessary to reprogram the controller to closely match plant use; rather, the program is adjusted using the Seasonal Adjust. By adjusting the controller's Water Budget/Seasonal Adjust from 100 percent, the controllers will automatically recalculate the application times by the corresponding percentage. For example, a programmed time of 30 minutes will run for only 15 minutes when set at 50 percent, saving half the normal water, or 24 minutes at 80 percent. You no longer are required to reprogram your controller for each ET rate (ET)—the combined process of water loss by evaporation and water transfer to the air through plant tissues; the controller will do all the adjustments.

Knowing how much water is applied per controller application cycle (every day, every other day, three day, five day or weekly cycle) and knowing the current ET or consumptive use, the percentage, or "Watering Index," can be calculated. By setting the Water Budget/Seasonal Adjust to this "Watering Index" percentage, the controller then recalculates the programmed run times to match applications with ET.

Normal summertime ET should be available from a local water conservation specialist or can be developed from CIMIS's historical database. This is an index of 100 and should closely match the controller applications. If it does not, consult with a watering auditor to develop a program. Current local ET is available on the internet via DWR's CIMIS weather station network, or some local papers carry ET information. Dividing current ET by summertime ET gives the current Watering Index to program your controller.

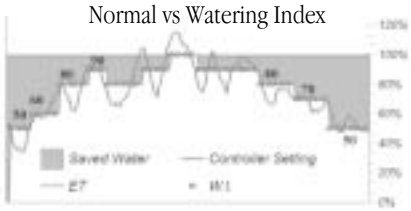
A local TV station (NBC affiliate Z21) in Bend, OR, started broadcasting the local Watering Index last year. During the weather segment, weatherman Bob Shaw presents a graphical illustration (Figure 1) on the Watering Index every morning at 6:35 am. Homeowners can then adjust their controller as they leave for work in the morning. They simply open the controller box, select Water Budget or Seasonal Adjust, press the up or down adjustment to read the Watering Index and all application times are adjusted accordingly. With the Water Budget/Seasonal Adjust set at 50 percent, a 30 minute programmed time will be limited to 15 minutes of run time,

Figure 1
Local Watering Index, Bend Oregon



applying only half the water of the normal programmed summertime application. Likewise, a programmed 20 minutes will run for 10 minutes. Increase the program budget to 80 percent, and the 30 minutes of programmed time becomes only 24 minutes of application and the 20 minutes becomes 16 minutes, saving 20 percent. Last year, by adjusting to the Watering Index in Bend, a water user could have saved over 13 inches of water (or 24 percent) of annual outdoor water usage (ET last year was higher than average for Bend) compared to using summertime controller set time for year-round watering. Most years, savings of 25 to 35 percent can be achieved. The accumulative applications by WI were within 5 percent of daily ET. Figure 2 shows a landscape controller with no adjustment versus adjusting to the Watering Index.

Figure 2
Controller Settings —
Normal vs Watering Index



A reported 1.5 million controllers are already installed in California with a built-in Water Budget or Seasonal Adjust feature. Using this feature, and assistance for local experts, households can, by a simple push of a button, match application with ET without needing to know the actual ET, how to recalculate run times or how to reprogram the controller. By coupling controller adjustments with a rain shutoff device a household will have an automated watering system that replenishes depleted soil moisture. Over-watering in the spring and fall will be eliminated and watering will be interrupted during rain showers.

Controllers are available from irrigation supply companies, landscape contractors, or Home improvement stores for around $50. For more information contact John Wynn at (916) 651-7035, e-mail jwynn@water.ca.gov.

2002 Recycled Water Task Force

On April 2, 2002, the 2002 Recycled Water Task Force held its first meeting at the CA/EPA building in Sacramento to develop a report to the Legislature of opportunities for and constraints to increasing the use of recycled water. The second meeting was held June 3, 2002, in Los Angeles.

The task force is a result of the signing of Assembly Bill No. 331 (authored by Assemblywoman Jackie Goldberg) into law by Governor Davis in October 2001 and is comprised of experts on the safe and beneficial uses of recycled water. Participants included a broad range of community, industry, and environmental representatives. In addition to 38 members representing recycled water stakeholders in California, over 20 individuals representing different interests were in attendance.

Organized and administered by DWR, the task force is chaired by Richard Katz, a member of the State Water Resources Control Board. Deputy Director Jonas Minton represents DWR on the task force. The task force will address the ways to increase the use of recycled water in industrial and commercial applications; the opportunities for increasing the use of recycled water in applications such as commercial laundries; the approaches to working closely with initiatives in the CALFED program to maximize water conservation; and water use efficiency strategies.

Science and Health Issues/Indirect Potable Reuse Workgroup will examine the scientific basis for current reuse standards, address the importance of emerging issues of scientific and public health concern, identify any areas of research needs, and substantiate the need to reconvene the California Indirect Reuse Committee. It will also make any other recommendations to remove impediments to water reuse.

The Plumbing Code/Cross Connection Control Workgroup will examine Appendix J of the Plumbing Code, and related regulations, as it pertains to recycled water and recommend amendments in order to advance the safe delivery and use of recycled water.

The CALFED Workgroup will identify opportunities for financing recycled water projects and to propose means to coordinate the efforts of various state and federal agencies in terms of financing these projects.

The Regulations and Permitting Workgroup will review the laws, regulations, and regulatory agency practice pertaining to recycled water, to suggest amendments to remove the impediments to the safe use of recycled water, and to propose uniform regulatory application of standards throughout the state.

For more information on the task force or different workgroups contact Fawzi Karajeh at (916) 651-9669, e-mail fkarajeh@water.ca.gov.

Recycled Water in Landscapes

By Julie Saare-Edmonds

In California, most recycled water used in landscape irrigation is a high quality tertiary treated (filtered and disinfected) resource that can be used to replace potable water for certain applications. It is *not* the same as graywater—untreated household wastewater which has not come into contact with toilet waste—which includes water from bathtubs, showers, and clothes washing machines. Graywater must be distributed underground and may not be used for food crops where contact with seeping water may occur. In contrast, recycled water can be used for watering ornamental plants as well as food plants. Recycled water is also suitable for use in fountains, fishponds and recreational lakes. All pipe and irrigation equipment used in irrigating with recycled water are colored purple and clearly marked to read "CAUTION: RECLAIMED WATER, DO NOT DRINK", a universal symbol to prevent cross connection with potable supplies. Valves and sprinkler heads have purple handles and water caps to designate their use in a recycled system. Backflow prevention is required as would be in any irrigation system.

Using recycled water in landscapes is becoming more common as more water recycling facilities come online and conveyance systems are built. In the past irrigation with recycled water has been used largely on public and commercial sites, but in recent years its use on private landscaping is also starting to increase. Several locations around the state are good examples of how recycled water can be suitable for residential landscaping. Two examples in northern California are Serrano, a 3500-acre community located in El Dorado Hills and Vintage Greens, a community in the town of Windsor. In both of these neighborhoods individual houses are dual-plumbed for both potable and recycled water. In southern California, the city of Irvine is a good example of a community with extensive recycled water usage. Irvine Ranch Water District states that 20 percent of its water supply is recycled water. In Irvine approximately 80 percent of public and commercial sites as well as some larger residential sites are irrigated with recycled water. As more facilities are built to produce recycled water and more sites plumbed to use it, the reuse of water will become even more prevalent.

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Since Senate Bill 2095, *the Water Recycling in Landscaping Act,* was passed in February 2000 producers of recycled water must determine if, within 10 years, they will provide recycled water within the boundaries of the local agency then notify the local agency (city or county) of that fact. Within six months of notification, the local agency must adopt a recycled water ordinance (if one is not already adopted).

OWUE's Recycling and Desalination Branch Web site went online May 15, 2001.
Visit the new site at:
wwwowue.water.ca.gov/recycle

Irrigation Scheduling Possibilities

By Peter Brostrom

Deciding when and how much to irrigate are some of the most important crop management decisions that farmers make. This process of deciding how often to irrigate and how much water to apply is called irrigation scheduling. Farmers have traditionally used their own experience and a "feel" check of soil moisture to decide when to irrigate. Often the irrigation schedule becomes set at a predetermined number of days depending on the soil type and the crop being grown.

California farm advisors and irrigation specialist have been researching and promoting a more quantitative approach to irrigation scheduling since the 1950s. A number of different scheduling methods have been developed and researched. There are systems based on climatic factors, measurement of soil moisture and plant water status or combinations of the factors. A number of studies done both in California and throughout the US and the world have shown that the use of a quantitative approach to irrigation scheduling will maintain or increase yield while decreasing the amount of water applied.

Despite the documented advantages and over 50 years of promotion, a quantitative approach to irrigation scheduling has not become widely used in California. Results of a 1995 survey of California Irrigation Management Information Systems (CIMIS) by University of California resource economist showed that the number of farmers in California who used CIMIS climatic data to schedule irrigation is small. Although the number has grown considerably since 1995, the percentage is still relatively small. A University of California alfalfa specialist study gives similar estimates for the percentage of alfalfa acres where a quantitative approach to irrigation scheduling is used. This is because many growers who adopt a quantitative approach depend on consultant services.

There are a number of reasons why a quantitative approach to irrigation scheduling has not been universally adopted by all growers. First, surface irrigation is used on more than 70 percent of the irrigated land in California. Because the water is either run down a furrow or across the field with surface irrigation, growers are not able to control how much water is applied. Also most fields do not have water meters, so even after the irrigation is finished the grower is unsure how much water has been applied. Second, farm logistics are often complicated so that timing the irrigation becomes difficult. Personnel schedules, equipment requirements and other crop management demands often can take precedence over the irrigation scheduling. Finally, most farmers and farm managers do not have the time to make the measurements required by most of the current irrigation scheduling systems.

Precise irrigation scheduling can help California maintain or increase agricultural yields while using less water, but more farmer-useable scheduling systems will have to be developed. Electronic advances in the past decade have led to several new technologies that look promising. One example is a new type of gypsum block that has been developed to measure and record soil moisture levels for more than a week at a time. These blocks can be set at several depths to give the grower a complete picture of the moisture in the soil root zone. These new blocks are currently being tested as a means to schedule irrigation in alfalfa and processing tomatoes. Another recent technology for tree crops is to measure trunk expansion and contraction. This expansion and contraction has been correlated with the tree moisture status. Again, the instrumentation is not overly expensive. A third approach that is still being developed is to use satellites to measure the crop canopy temperature. Several models have been developed that can relate canopy temperature to plant stress and soil water depletion, but their accuracy and ease of use still have to be tested.

It is possible that in the future farmers could check soil moisture and plant water status, and view field water stress map all from the computer in their office. For now scientist and researchers are working to develop some simpler methods that growers themselves can use to better decide when to irrigate.

For more information contact Peter Brostrom at (916) 651-7034), e-mail brostrom@water.ca.gov.

Telnet Access to CIMIS Data Discontinued

By Bekele Temesgen

The Telnet/Dial-Up option for accessing and retrieving the California Irrigation Management Information System (CIMIS) data was discontinued June 30, 2002. Starting on July 1, 2002, the only option for retrieving the CIMIS data is at www.cimis.water.ca.gov.

For users interested in an automated access to the CIMIS data, an FTP site has been created at ftpcimis.water.ca.gov. Seven-day hourly and daily data are stored under the "pub" directory. Also included in the directory is a Readme.txt file that describes the data format for the hourly and daily data files.

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Urban Water Management Plan Update: Some Plans Incomplete

By Carmen Harms

The Urban Water Management Planning Act (Water Code Section 10610 *et seq.*), as amended by Senate Bill 610 - effective January 1, 2002 - now requires the Department of Water Resources to take into consideration if an urban water supplier has submitted an updated urban water management plan when determining if the urban water supplier is eligible for DWR-administered funds. The Act defines several elements of a plan including water supply information, water transfers, water use, recycling, 20-year supply and demand comparison, single- and multiple-dry year supply reliability data, single- and multiple- dry year supply and demand comparison and water shortage stages.

DWR reviewed 307 plans that were submitted on or before December 31, 2001, and 193 of those plans, nearly 63 percent, were incomplete. The table (at right) summarizes the number of times a plan did not include the specified element. Of those incomplete plans submitted, about 72 percent contained incomplete elements regarding single- and multiple-dry year supply reliability data, and single- and multiple-dry year supply and demand comparisons.

In addition, the Act requires plans to address water conservation measures. Urban suppliers can meet these requirements by addressing either the 16 demand management measures (DMM) or 14 DMMs. Signatories to the California Urban Water Conservation Council may submit their report on 14 Best Management Practices (BMPs). The Act was amended in October 2000 from 16 to 14 DMMs so as to be consistent with the Council's BMPs. Therefore, some of the suppliers who submitted plans in 2000 included 16 DMMs while others included 14 DMMs.

Incomplete Plan Elements

Plan Element	Number Missing this Element
No Water Supply Information	1
Insufficient Detail for Water Transfers	1
No Water Use Information	15
No Recycling Discussion	58
No 20-year Supply and Demand Comparison	30
No Single-dry Year Supply Reliability Data	75
No Single-dry Year Supply and Demand Comparison	91
No Multiple-dry Year Supply Reliability Data	80
No Multiple-dry Year Supply and Demand Comparison	96
No Stages for Water Shortage	27

Agricultural Drainage Reuse Study Proposals Submitted to DWR

By Dave Koller and Manucher Alemi

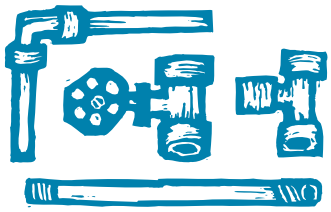
In March, the Department of Water Resource's Office of Water Use Efficiency and the San Joaquin District (Division of Planning and Local Assistance) sought proposals for developing methods of reducing and reusing subsurface agricultural drainage water. The purpose of the program is to help reduce and manage salt and selenium from drainage water in the West Side of California's San Joaquin Valley to help sustain agricultural productivity and protect water quality. Eighteen proposals were submitted by the April 5, 2002 deadline. The proposals were reviewed by a technical review committee and The proposals were reviewed by a technical review committee and eleven of eighteen submitted proposals were approved for DWR funding.

The program is in its third year of implementation and is authorized by the Safe, Clean, Reliable Water Supply Act of 1996. Government agencies, universities and local agencies are eligible to apply. Projects fall into one of four subject categories including on-farm Drainage Reduction (Source Reduction), Drainage Reuse, Drainage Treatment, and Salt Separation and Utilization. Examples of some previously funded and ongoing projects include the development of livestock-based forage production systems in the Southern San Joaquin Valley using saline drainage water and salt tolerant forages. Another project looks at treatment of concentration of drainage water through irrigation of salt-tolerant crops and membrane processes. A third project attempts to determine the effectiveness of solar distillation on recovering salt and usable water from agricultural drainage water.

The funding for the program is authorized until fiscal year 2005-06. The next round of proposal solicitation will be in March 2003. For more information, contact Dave Koller at (916) 651-7032, e-mail dkoller@water.ca.gov.

Statewide Drainage Program Announces New Projects

By Dave Koller and Baryohay Davidoff



The Office of Water Use Efficiency is managing several new projects to address irrigation drainage issues across the state. The projects, which are in cooperation with local agencies that share the costs of the studies with the state, will look at economically and environmentally sensible technology and management methods to reduce the amount of drainage from agricultural lands.

Salinity Mobile Mapping and Analysis
The salinity mobile mapping and analysis project is co-sponsored by DWR and the Coachella Valley Water District. The Coachella Valley Resource Conservation District is carrying out the work. This project focuses on creating salinity profiles on growers' fields through the use of a mobile mapping unit called a "salt sniffer." The unit determines salinity levels by dragging a sensor across the field that relays information to a data logger. The sensor measures the electromagnetic induction conductivity (EC) of the soil, an indicator of salt levels. A high clearance field transport vehicle (tractor) equipped with the salt sniffer and a global positioning system (GPS) unit takes reading locations and determines the depth and distribution of EC within the soil profile and crop rootzone. The data is then used to create field salinity maps. The salinity is mapped by depth and location. Growers use the information to determine where yield losses due to excessive salinity might occur as well as which areas of the field require more or less leaching. More control over appropriate leaching of salts will lead to less drainage in areas of the field that might otherwise have been over-leached.

Development of Salinity Budgets for the San Joaquin Basin
The West Stanislaus Irrigation District is investigating changes in soil salinity levels as a result of drainage flow reductions on the west side of the San Joaquin Valley. The study focuses on the Grasslands and Westlands areas its first year. In the second year, salinity mass balances will be performed for the Tulare, Kern, and northern areas. Drainage flow reductions have been achieved over the last several years through a combination of measures including tail water recirculation, tile drainage recirculation and improved irrigation technologies. Investigators will collect hydrologic and water quality data from water districts, consulting firms, and state and federal agencies suitable for constructing hydrologic and salinity budgets. In addition to drainage flow reductions, mandated water deliveries to private wetlands and refuges has resulted in increased importation of salt and changes in the pattern of release, timing amounts and salt loads to the San Joaquin River. This project will investigate these management changes and help quantify their impacts on the regional aquifer beneath the West Side of the San Joaquin Valley.

Using Forages as Feed to Manage Drainage Water in the San Joaquin Valley
This project is managed by the Statewide Drainage Reduction and Reuse Program will research the use of forages as feed to manage drainage water in the San Joaquin Valley. The project's goal is to use salt tolerant crops such as Bermuda grass and other forages to provide a year around supply of high quality feeds and a potential source of selenium as nutrient for cattle. The feeds would be suitable for economic average daily weight gains in cattle or sheep. The forage crops will also be available for sale to dairy farms. Researchers from the University of California, Davis will evaluate livestock performance and demonstrate low-cost methods of forage use. Investigators will assess the soils' physical and chemical changes over the three-year project period. They will also look at tile drainage water quality and quantity as a result of drainage water application and the crop rotation-grazing system. Researchers will integrate the data into a model that can be used to evaluate returns to the livestock enterprise, while assessing the costs and benefits of maximizing saline water disposal. They hope to show that reusing saline drainage water for irrigation could transform it from an environmental burden into an economic asset.

Determining if Subsurface Drip Irrigation Causes Detrimental Salinity Buildup in the Upper Layers of Soil of Row Crops
The goal of this project is to determine if there is any detrimental salinity buildup in the upper layers of soil caused by the use of subsurface drip irrigation (SDI) on row crops. Cal Poly San Luis Obispo scientists will focus on SDI systems in salinity-affected areas of the San Joaquin Valley. In part because of its efficient use of water, SDI systems have become widely adopted. It is well recognized that, in general, average applied irrigation depths under SDI are less than under sprinkler or surface irrigation methods. There are, however, still many unanswered questions concerning SDI such as to what extent the salt building is up on the periphery of the wetted area and which practices can minimize salt buildup. Answering these two questions can help in managing irrigation and drainage and maintaining a sustainable soil environment and crop production. Researchers will document the spatial and temporal characteristics of soil under SDI in row crops. They will also document water usage, water quality, cultural practices and rainfall on each field studied and identify the causes and rate of salinity buildup and identify essential practices used by farmers who use SDI. From this information, scientists will identify practices that might be used to reduce or avoid salinity buildup in root zones using this efficient irrigation practice.

For more information on these drainage projects contact Dave Koller at (916) 651-7032, e-mail dkoller@water.ca.gov, or Baryohay Davidoff (916) 651-9666, e-mail baryohay@water.ca.gov.

Planning for Drainage Water Reuse

By Ray Hoagland and Manucher Alemi

We have been working on developing a modeling tool by which an optimum (maximized net income) combination of components for drainage water reuse can be determined and a conceptual economic model has been developed. As modeled, drainage is able to be used progressively by salt tolerant grasses and halophytes; evaporated in solar evaporators and other evaporation systems; treated for producing fresh water for marketing or reuse and then discharged directly to a river. The model considers the value of crop production, the sale or reuse of treated water and the costs of drainage treatment (biological and reverse osmosis), disposal of selenium (from biological treatment facility) and salt (from solar evaporators or any other evaporation system) as well as selenium load limitations on the discharge of drainage water to the river. A set of equations determine economically optimal acreage and the installed capacities of treatment and evaporative facilities subject to load limits (water quality constraints), soil and agronomic requirements (leaching requirement), district and on-farm reuse and percolation and runoff coefficients, and technical (treatment plant efficiency) and economic factors.

This conceptual model tells us, given a specified number of acres of irrigated land some with tile drains generating drainage water:

- how many additional acres should have drains installed;
- how many acres are needed for salt tolerant grasses, halophytes, and solar evaporators;
- how much drainage water should be discharged to the River versus how much should be treated by reverse osmosis, biological treatment or evaporated by other means; and
- what is the cost of selenium and salt disposal.

Preliminary analysis shows that the results are sensitive to the cost of salt disposal, with biological treatment being a good alternative to dedicating land to solar evaporators (or using other evaporative methods) given currently estimated salt disposal costs.

The model is currently set up to handle multiple water year types on a probability-of-occurrence basis and is basically at a proof-of-concept stage. Verifying the data and assumptions for reasonableness and obtaining the additional data necessary to specify a seasonal model are the next steps. For more information contact Ray Hoagland at (916) 653-67085, e-mail ray@water.ca.gov, or Manucher Alemi (916) 651-9662, e-mail malemi@water.ca.gov.

Water Authority Conservation Program Named Best in Southwest

In May 2002, The U.S. Department of the Interior, Bureau of Reclamation, presented the San Diego County Water Authority with an award of excellence for its residential high-efficiency clothes washer (HEW) voucher program. The HEW program was recognized as the top Water Conservation Field Services Program among four districts in Reclamation's Lower Colorado Region. Each year, Reclamation names one program among many water conservation projects throughout the Southwest for this award. Bill Steele, manager of Reclamation's Southern California area office, presented the award.

The Water Authority's HEW program was initiated in 1994 to conserve water and reduce wastewater. The Authority provides vouchers worth $125 toward the purchase of high-efficiency clothes washers, which use 40 percent less water and 55 percent less energy than standard machines. Reclamation granted $60,000 to co-fund the program. Additional funds were provided by the Water Authority, its member agencies and the Metropolitan Water District of Southern California.

The program not only saves water and electricity, but also helps consumers save money. With a $125 voucher offered by the Water Authority, the cost of a high-efficiency washer is within range of standard models. The voucher is used at the point of purchase for immediate savings. Additionally, the clothes are washed cleaner and have less moisture content due to the HEW's faster spin cycle. This translates to lower water bills and lower energy bills because of the reduced time clothes need to be in the dryer. Vouchers are available by calling a voucher hotline number.

During the 2001 fiscal year, more than 2,200 washers were purchased with vouchers. Water Authority officials anticipate that number will increase to 5,000 voucher purchases next year. To date, 12,000 HEW washers have been purchased, saving 470 acre-feet of water. An acre-foot is equivalent to about 326,000 gallons of water, or the approximate amount of water two families of four use in one year.

The San Diego County Water Authority is a public agency serving the San Diego region as a wholesale supplier of water from Northern California and the Colorado River. The Water Authority works through its 23 member agencies to provide a safe, reliable water supply to almost three million county residents.

Awarding Excellence *(from left to right) Jim Turner, SDCWA Chair, Bill Jacoby, SDCWA Water Resources Manager, Bill Steele, BUREC Area Manager, Cindy Hansen, SDCWA Program Manager, Meena Westford, BUREC Water Conservation Coordinator.*

Water Conservation Newsbriefs

Santa Rosa Water Conservation Rebate Program Participants Reduce Landscape Water Use by 25 Percent in 2001

In 2001 the City of Santa Rosa Water Conservation Program launched its Irrigation Efficiency Rebate, an incentive program designed to encourage efficient landscape water use. Customers with "irrigation only" water accounts for landscapes were informed they could earn $1.53 per 1,000 gallons of water saved below their water budget each year.

All of the City's 1,450 irrigation accounts received an invitation to submit an application by February 1, 2002 for the 2001 calendar year. In addition, 250 landscape and irrigation professionals received brochures and letters from the City informing them about the new incentive program.

Eight customers with a total of sixteen irrigation accounts (one percent of the irrigation accounts) submitted applications. Water Conservation Staff calculated water budgets based on local weather data and site-specific landscape measurements for these accounts. The water budgets were compared to actual water use for 2001 to determine whether customers earned rebates. The results were encouraging.

Three accounts earned small rebates (total earned was $40.12). But that's not the whole story. Eighty percent of accounts participating in the rebate program (thirteen out of sixteen) significantly reduced water use and saved money in 2001.

As a group, the thirteen accounts improved landscape water use efficiency and reduced water use by twenty-five percent. Collectively, they applied 2.1 times the water budget in 2000 but reduced this to 1.6 times the water budget in 2001. This resulted in a savings of 2,052,000 gallons and nearly $5,000 in water fees in 2001. This is especially impressive considering evapotranspiration or "ET" (weather conditions that cause water loss from the landscape) was nineteen percent higher in 2001 than in 2000.

"We know it can be challenging to reduce landscape water use," explained Colin Close, Water Conservation Representative for the City of Santa Rosa. "But now we have seen how well our customers can do given an incentive to try. Even though only a few sites participated, they saved an average of 14,200 gallons per summer day - not bad for our first year."

Looking toward the future, Close said, "We can do better - we have the potential to save more than half a million gallons per summer day in the commercial sector. It's a big goal, but we can achieve it with the help of the landscape and irrigation professionals managing these sites. And together we will save our customers tens of thousands of dollars in water fees."

Santa Rosa Water Conservation Program Wins Grants for Two High-Tech Conservation Projects

In May 2002 the City of Santa Rosa's Water Conservation Program was awarded two grants for high-tech water conservation projects that take advantage of new approaches to outdoor water conservation. The California Department of Water Resources is providing a grant totaling $93,587 (Proposition 13 bond money) for a pilot project that tests "ET-timers" which automatically update irrigation schedules using local weather information. "ET" stands for "evapotranspiration" (a measure of water used by the landscape based on weather conditions).

For one irrigation season (April - October 2003), up to 70 homeowners and 10 small business sites will not need to reprogram their irrigation timers: the new ET-timers will do this automatically based on current weather data. Applying just the right amount of water at the right time could reduce water use substantially while keeping landscapes healthy. The pilot project will look at the costs versus the benefits, customer satisfaction, landscape appearance, and other factors. If the timers significantly reduce water use and maintain healthy landscapes, the Water Conservation Program could develop a long-term incentive program to encourage customers to switch to ET-timers.

A grant from the National Aeronautics and Space Administration (NASA) totaling $89,880 will be used to determine the size and types of landscapes for each of Santa Rosa's 48,000 water customers using NASA satellite photos and aerial images. The City will match NASA's grant with $42,200 from the City's Capital Improvement Project for reducing the peak summer water demand. Space Imaging (a private consultant) will provide the expertise to gather the right images and create a special software program to automatically analyze the images. With accurate landscape measurements and aerial pictures for each account, the Water Conservation Program can provide information about the water needs of each site and how efficiently water is being used in the landscape. Water Conservation staff will be able to quickly assess the water and money savings potential and provide technical support to help customers reduce water use while maintaining beautiful landscapes.

Water Conservation Events

2002 Grower Irrigation Seminar Series

All Grower Irrigation Seminars are free of charge and take place at Southern California Edison AgTAC, Tulare, California. Seminars are sponsored by the California Department of Water Resources and conducted by The Center for Irrigation Technology, California State University, Fresno. Preregistration is required: (800) 772-4822. For more information visit www.cati.csufresno.edu/cit or call (559) 278-5752.

Introduction to Pumping Plant Design
August 15, 2002
8:00 a.m. - 12:00 noon
Topics include pump performance characteristics, specifying pumps to meet design requirements, appurtenant components and VFD and high efficiency motors.

Frost Protection Systems
September 10, 2002
8:00 a.m. - 9:30 a.m.
Topics include available technology, characterizing susceptibility, designing systems, operational considerations and understanding plant physiology.

Winterizing Irrigation Systems
October 8, 2002
8:00 a.m. - 9:30 a.m.
Topics include protection from freezing, flushing and disinfection, protection from theft and vandalism, protection from pest damage and component removal and storage.

WateReuse Association Reuse Symposium XVII—Water Reuse for the Future: Use it Again, America

September 8 to 11, 2002
Orlando, Florida
The theme for this year's Reuse Symposium is *'Water Reuse for the Future; Use it Again, America!'* The Symposium—the world's preeminent conference devoted entirely to water reuse—features concurrent technical sessions, exhibits, committee meetings, workshops, and other events. For more information visit www.watereuse.org.

Ozone III: Agriculture and Food Processing Applications of Ozone as an Antimicrobial Agent

October 28 to 30, 2002
The Radisson Hotel
Fresno, California
A conference presented by G & L AgriTec, with primary sponsorship and support by California State University, Fresno and the California Agricultural Technology Institute (CATI). Anticipated topics will cover research, case studies and experimental results of ozone generation, use and biocidal efficacy in food and agricultural applications. Subject categories include ozone's roles in Ag Security, Food Safety & Quality, Water Reuse, Advanced Technology, Synergistic Combinations, and Legislation Impacts on use of ozone. For more information visit www.cati.csufresno.edu/ozone.

California Urban Water Conservation Council

By Mary Ann Dickinson, Executive Director

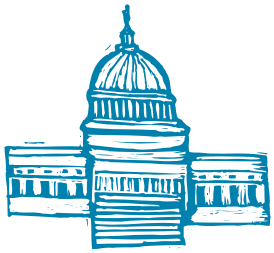
BMP Reporting Now Due!

It is time for water agencies to once again report on their Best Management Practice (BMP) activity. The California Urban Water Conservation Council is requesting reporting for the fiscal years 2000-2001 and 2001-2002. The reporting forms are available on the Council's Web site at www.cuwcc.org. If you are a Council signatory and have forgotten your reporting password, please call the Council office at 916-552-5885. Training workshops on BMP reporting will be held this summer. Check the Calendar page on the Council's Web site for the training workshop closest to you.

Next Year's BMP Exemptions Due!

The BMP exemption applications for the next 2002-2003 reporting year are now due. The Council has developed spreadsheets for calculating the cost-effectiveness of each of the quantifiable BMPs, and these spreadsheets have been posted on the Council's web site under the Technical Resources Page. The Council will also be holding training workshops this fall on how to evaluate the costs and benefits of BMPs and how to prepare exemption applications. Check the Calendar page on the Council's Web site (www.cuwcc.org) for the training workshop closest to you.

Water Conservation Laws and Legislation



AB 2365 (Goldberg) Water Recycling and Dual Plumbing Bond Act of 2002 as introduced 2/21/02.
This bill would enact the Water Recycling and Dual Plumbing Bond Act of 2002 which, if adopted, would authorize grants and/or loans for financing water recycling and dual plumbing infrastructure programs and the of bonds in the amount of $575.9 million. STATUS: Died: Failed to move out of house of origin by 5/31/02.

AB 2643 (Liu) Water Conservation and Recycling as introduced 2/22/02.
This bill would required the Department of Water Resources, in updating the California Water Plan to include, among other strategies, development of water conservation and water recycling. STATUS: Died. Failed to move out of house of origin by 5/31/02.

AB 2717 (Hertzberg) Water: Desalination as introduced 6/12/02.
This bill would require the Department of Water Resources to report to the Legislature on potential opportunities and existing impediments for promoting the development of seawater desalination. This bill would require the department to convene a Desalination Task Force to assist the department. STATUS: Senate Agriculture and Water Resources Committee.

AB 2734 (Pavley) Conservation as amended 5/8/02.
This bill would: (a) amend the Real Estate Transfer Disclosure Statement required by Civil Code section 1102.5 to include disclosures of specified water conservation devices and to require their installation prior to transfer of title; (b) amend the Water Conservation in Landscaping Act (Government Code section 65590, et. seq.) to required the Department of Water Resources to adopt specified amendments to the Model Water Efficient Landscape Ordinance. In the 5/8/02 amended version the exemption for energy–efficient clothes washers from sales tax has been deleted. STATUS: Died: Failed to move out of house of origin by 5/31/02.

SB 621 (Costa) Water Transfers as introduced 2/22/01.
SB 621 would make modest technical changes to Water Code Section 1810 et seq. STATUS: Assembly Water, Parks and Wildlife Committee.

SB 1348 (Brulte) Water Conservation as amended 5/9/02.
This bill would, as amended on 5/9, require the Department of Water Resources to take into consideration whether an urban water supplier is implementing water demand reduction measures identified in its urban water management plan when evaluating applications for grants and loans made available from the Water Conservation Account for funding urban water conservation projects. STATUS: Assembly Water, Parks and Wildlife Committee.

SB 1710 (Costa) Water Bond Act of 2002 as amended 5/2/02.
This bill would enact a Water Bond Act of 2002, which, if adopted, would authorize the of bonds in an unspecified amount. This bill would provide funds for water projects, facilities and programs, including groundwater monitoring, groundwater recharge and management and groundwater storage. As amended, the SB 1710 is now designated as the "Safe, Clean, Reliable Water Supply Bond Act of 2002". Several programs were added including groundwater supply and reliability and protection, community groundwater and watershed protection. STATUS: Died: Failed to move out of house of origin by 5/31/2002.

SB 2070 (Johannessen) Water Supply Security and Water Supply Reliability Act of 2002 as amended 3/21/02.
This bill would enact a water bond in the amount of $2.9 billion and would be submitted to the voters on the November 5, 2002 statewide general election. The bill would provide funds for drinking water security projects, clean water programs, desalination and contaminant removal projects, integrated regional water management projects, local projects which reduce Colorado River water use, funding for local watershed management plans and surface water storage projects. STATUS: Died: Failed to move out of house of origin by 5/31/2002.

Definitions

Chapter(ed): "chaptered" means that the Legislature has passed the bill and the Governor has signed the bill into law. Chapter (plus a number) refers to the number given to the bill at the time it was signed. When a bill has been passed by the Legislature and enacted into law, the Secretary of State assigns the bill a "chapter number" such as "Chapter 123, Statutes of 1992," which is subsequently used to refer to the measure in place of the bill number.

Status: "Status" explains where the bill is located in the legislative process. This bill could be in the Senate or in a particular committee to be reviewed or it could be chaptered.

Statutes of 2002: "Statutes" refers to the legislative session in which the bill was passed.

WATER CONSERVATION NEWS
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Address Correction Requested

Creating a Fire Safe Landscape

When temperatures start hitting triple digits, we are reminded that the fire season is here. If you live in an area that could face a fire danger and you are planning a new landscape, consider plants that will resist burning or retard fire. Under ordinary conditions, these plants will not catch on fire even when exposed to direct flame.
The table below lists several fire resistant plants that can be used in your landscape.

Local nurseries and the University of California Cooperative Extension Office can help you select the appropriate plants. Many fire retard plants are classified as low to medium water use plants as well, so you gain both the benefits of fire protection and low water use. Remember, plant selection is just part of an overall fire protection strategies. Contact your fire department for additional measure to help you avoid fire dangers.

Fire Resistant Plants

Common Name	Botanical Name	Flower Color	Water Use
Ground Covers			
Aaron's beard	*Hypericum calycinum*	Gold	Medium
California Lilac	*Ceanothus spp*	Blue	Very Low - Low
Trailing rosemary	*Rosemarinus prostratus*	Blue	Low - Medium
Wooly yarrow	*Achillea tomentosa*	Yellow	Low - Medium
Shrubs			
California Lilac	*Ceanothus spp*	Blue	Very Low - Low
Catanlina Cherry Laurel	*Prunus lyonii*	White	Low
Italian Buckthorn	*Rhamnus alaternus*	Yellow	Low - Medium
Oleander	*Nerium oleander*	Various	Low – Medium